65 126. The broad-band polarizer according to claim 122 wherein said only one liquid crystal material is a non-cross-linkable liquid crystal

66 127. The broad-band polarizer according to claim 122 wherein said only one liquid crystal material is a nematic.

67 128. The broad-band polarizer according to claim 122 wherein said only one liquid crystal material has at least one permanently attached chiral group.

68 129. The broad-band polarizer according to claim 122 wherein said at least one chiral material is non-cross-linkable.

69 130. The broad-band polarizer according to claim 122 wherein said at least one chiral material is polymerizable.

70 131. The broad-band polarizer according to claim 122 wherein said at least one chiral material does not have a mesogenic group.

71 132. The broad-band polarizer according to claim122 wherein said at least one chiral material does have a mesogenic group.

72 133. A method of fabricating a broad-band polarizer comprising the step of:

forming a film from only one liquid crystal material and at least one chiral material such that said only one liquid crystal material is distributed non-linearly across the thickness of said film in a plurality of similarly non-linearly distributed sites having pitches greater than said at least given pitch in said only one liquid crystal material.

73 134. The method according to claim 133 wherein said only one liquid crystal material is a polymer.

Sub B1 Cont

WE CLAIM:

122. A broad-band polarizer comprising:

a film in cholesteric order of only one liquid crystal material and sites of non-linearly varying pitch across the thickness of said film and at least one chiral material.

123. The broad-band polarizer according to claim 122 wherein said only one liquid crystal material is a polymer.

124. The broad-band polarizer according to claim 122 wherein said only one liquid crystal material is a monomer.

125. The broad-band polarizer according to claim 122 wherein said only one liquid crystal material is an oligomer.

126. The broad-band polarizer according to claim 122 wherein said only one liquid crystal material is a non-cross-linkable liquid crystal

127. The broad-band polarizer according to claim 122 wherein said only one liquid crystal material is a nematic.

128. The broad-band polarizer according to claim 122 wherein said only one liquid crystal material has at least one permanently attached chiral group.

129. The broad-band polarizer according to claim 122 wherein said at least one chiral material is non-cross-linkable.

130. The broad-band polarizer according to claim 122 wherein said at least one chiral material is polymerizable.

131. The broad-band polarizer according to claim 122 wherein said at least one chiral material does not have a mesogenic group.

132. The broad-band polarizer according to claim122 wherein said at least one chiral material does have a mesogenic group.

133. A method of fabricating a broad-band polarizer comprising the step of:

forming a film from only one liquid crystal material and at least one chiral material such that said only one liquid crystal material is distributed non-linearly across the thickness of said film in a plurality of similarly non-linearly distributed sites having pitches greater than said at least given pitch in said only one liquid crystal material.

134. The method according to claim 133 wherein said only one liquid crystal material is a polymer.

135. The method according to claim 133 wherein said only one liquid crystal material is a monomer.

136. The method according to claim 133 wherein said only one liquid crystal material is an oligomer

137. The method according to claim 133 wherein said only one liquid crystal material is a non-cross-linkable liquid crystal.

138. The method according to claim 133 wherein said only one liquid crystal material is a nematic.

139. The method according to claim 133 wherein said only one liquid material has at least one permanently attached chiral group.

140. The method according to claim 133 wherein said at least one chiral material is non-cross-linkable.

141. The method according to claim 133 wherein said at least one chiral material is polymerizable.

142. The method according to claim 133 wherein said at least one chiral material does not have a mesogenic group.

143. The method according to claim 133 wherein said at least one chiral material does have a mesogenic group.